



# Multizone system until 4 zones - PSMZ100

## Owner's Manual - Installation and Operating Instructions

Please read this manual carefully before installation and use

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## **1. Components**

- 1.1 Main board
  - PSMZ100 - main board - until 4 zones
- 1.2 Master units - Programmable
  - ETN-M100-PROG- wall mount master thermostat - Programmable
  - FMT-M100-PROG – Flush mount master thermostat - Programmable
  - ETN-M100 – wall mount master unit – NON programmable.
  - FMT-M100 – flush mount master unit – NON programmable.
- 1.3 Zones units
  - ETN-Z100-PROG - wall mount zone thermostat. - Programmable
  - FMT-Z100-PROG – flush mount zone thermostat – Programmable
  - ETN-Z100 – wall mount zone unit – NON programmable.
  - FMT-Z100 – flush mount zone unit – NON programmable.

## **2. Options and features**

- 2.1. The Master and the Zone units can be programmable or non programmable(the thermostats MUST be SCI type for Multizone)
- 2.2. State of art thermostats , wall mount, very slim units or the last word in technology , Flush mount units.
- 2.3. The system has Autochange over (Cool + Heat mode), that means that the system can cool some of the zones and after heat others without changing the thermostats.
- 2.4. The thermostats have Set cool different than Set heat for confort purpose.
- 2.5. The big display in the thermostats allow to see the room temperature as well as the set temperature.
- 2.6. All the system can be select to Set back (Economy mode) by press one button in the master unit.



- 2.7 Single zone Set back (Economy mode) by press one button in the specific zone unit.
- 2.8 Each zone has Fan on or Autofan feature, that means that when the system (cool or heat) or not in demand you can have just fan into the specific zone .

### **3. Options and features for technician**

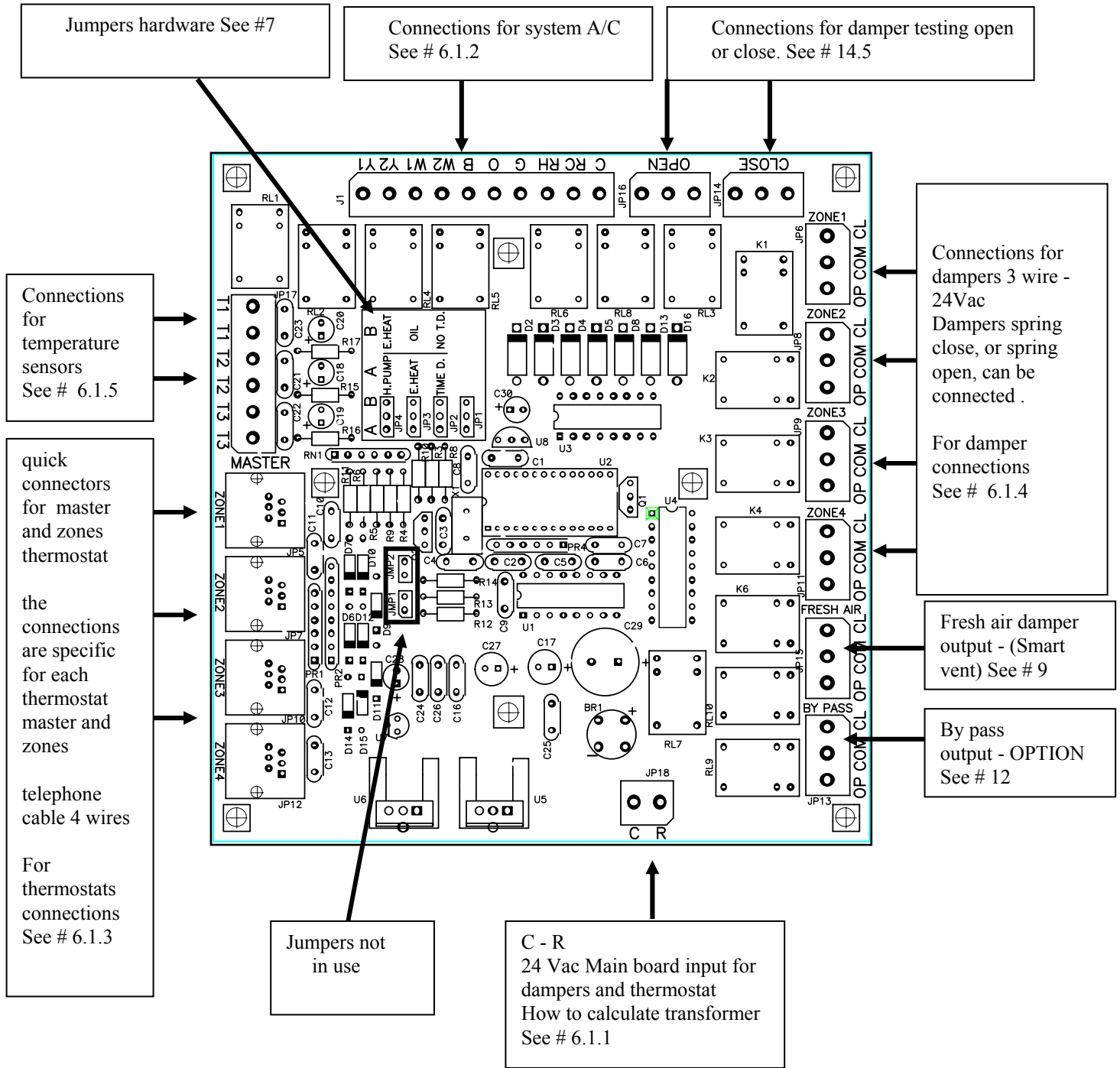
- 3.1 The main board "SUPER all in one" that means you can change at the last minute the configuration for the main board to suite the system:
  - Heat pump or not.
  - Fan electric or oil/gas.
  - Heat pump active in cool "O" or in heat "B".
- 3.2 By pass output option, for logic See # 12
- 3.3 Hot connection for open or close damper. For logic See trouble shooting # 14.5
- 3.4 Quick connectors in between the main board and the thermostats. See # 6.1.3
- 3.5 Quick connectors for the damper connections.
- 3.6 Discharge sensor for freeze in cooling and over heat in heating. See logic temperature sensors # 6.1.5
- 3.7 Sensors for the fresh air damper. See logic temperature sensors # 6.1.5
- 3.8 Dampers connections and options . See # 6.1.4

### **4. Accessories**

- 4.1. Temperature Sensor with 30 inches lead - Part No. TS01
- 4.2. Temperature Sensor in decorative box - Part No. RS01
- 4.3. Duct temperature sensor - Part No. DT01
- 4.4 Outdoor temperature sensor in sealed box - Part No. OT01

### **5. General explanation for main board**

- 5.1 .Main Board :
  - The main board is install close to system (furnace).
  - The main board need a 24Vac transformer. For calculating transformer sizes See # 6.1.1
  - All the connections, dampers, thermostats, and system are connected to the main board (home run).
- 5.1.2 Layout of main board





**6. Wiring Connections**

6.1 Connections for main board

6.1.1. Connection for the 24Vac for the Main Board - See layout main board # 5.1

The main board need 24Vac in order for the thermostat and the dampers to work.

Formula for the transformer sizes:

$$\begin{array}{rcl} \text{Main board + thermostats} & = & 6 \text{ VA} \\ \text{Dampers (number of dampers x current of each(amp) x 24)} & = & \text{(see sample bellow)} \\ \hline & & \text{Total VA transformer} \end{array}$$

Sample:

$$6 \text{ dampers} \times 0.2 \text{ Amp} \times 24 \text{ Vac} = 28.8 \text{ VA}$$

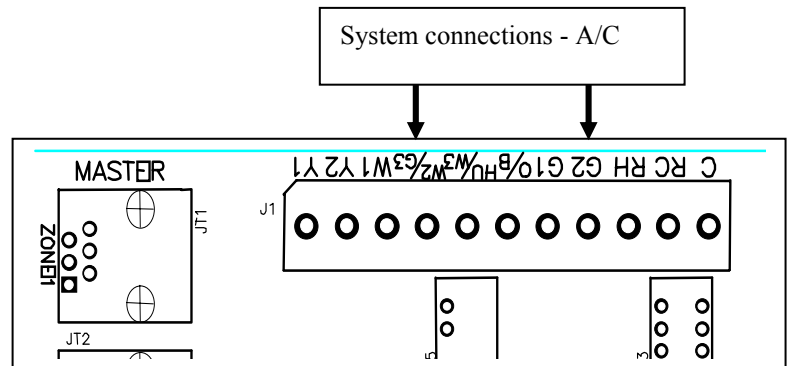
6.1.2. Connections for System.

This zoning system is multistage, that means that the stages are bring on by differential of ONE thermostat.

If you have a 1 heat, 1 cool system your connections are:

Connections for 1 heat - 1 Cool - HC11

- C - Common**
- Rc - Phase for Cool**
- Rh - Phase for Heat**
- G2 - *Not in use*
- G1 - Fan**
- B/O - *not in use*
- HU/W3 - *not in use*
- W2/G3 - *Not in use*
- W1 - Heat**
- Y1 - Compressor/Cool**
- Y2 - *Not in use*



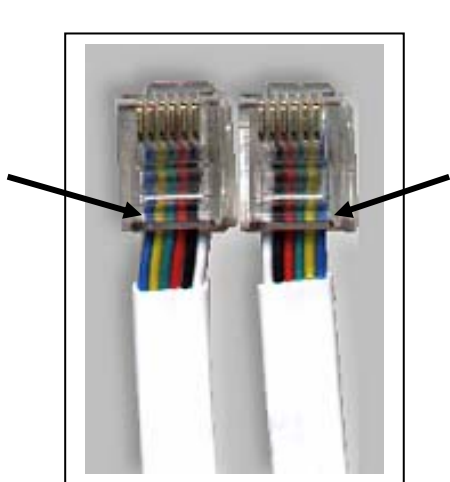
If you have a multistage unit connect accordingly to the terminals, no change in the jumpers or the logic is needed.

THE EMERGENCY HEAT (EMH) IN HEAT PUMP TYPES IS NOT SELECTABLE - IT WILL SWITCH ON BY REQUEST OF TEMPERATURE.



**6.1.3. Connections for thermostats**

The connections in between the main board and the thermostat is by Telephone Jack.  
 This is a 4 wire cable. (can be used also 6 wire cable, the extra wires do not affect the system)  
 The picture bellow shows the connections.



Picture 1

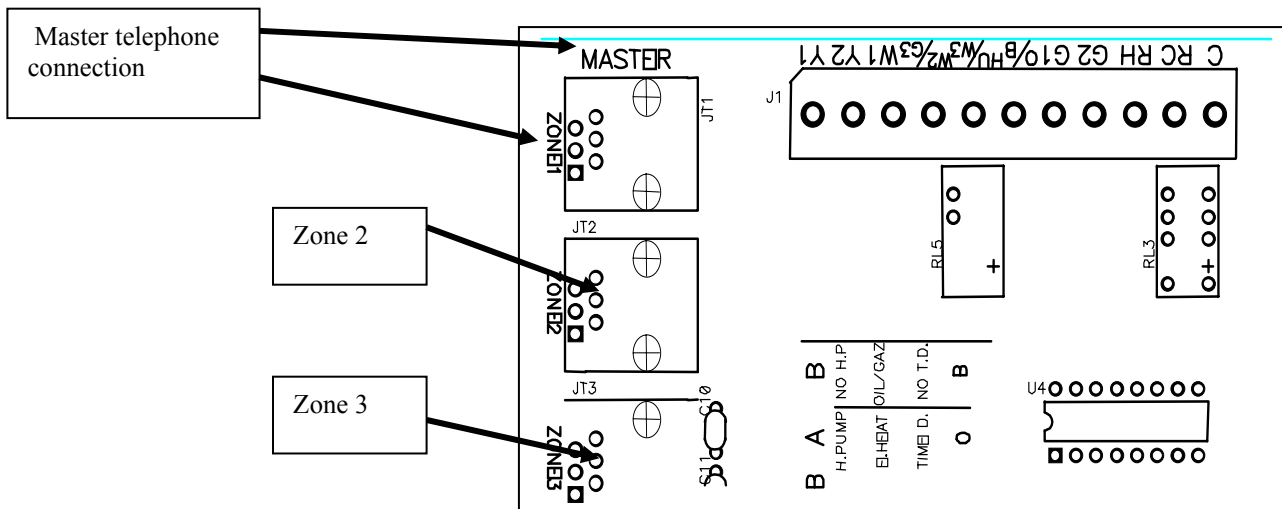


Picture 2

The connections are reverse you can see the blue wire, (arrows) when you hold both of the Telephone jack in the same way, the blue wire is the RIGHT, and the other on the LEFT. (Picture 1)  
 If you hold the telephone jack one in front of the other, the blue wire is one in front of the other. (Picture 2)

**Connection in the main board**

The connection for the master unit (same as Zone 1) in the main board, is clearly marked.  
 Each of the zones has it's own Telephone jack and also clearly marked.





6.1.4. Connection for Dampers.

The dampers outputs are 3 wire 24Vac , Max 1Amp each.

The terminals are

- OP = Open
- COM = Common
- CL = Close

Also spring close or spring open dampers can be connected.

For spring close:

- OP = Open
- COM = Common
- CL = Close not connected

For spring open:

- OP = Open not connected
- COM = Common
- CL = Close

6.1.5. Connections for temperature sensors.

In the main board there are 3 temperature sensor connections.

T1 - T1 = Return air sensor (For fresh air damper)

T2 - T2 = Outdoor temperature sensor (For fresh air damper)

T3 - T3 = Discharge temperature sensor.

**IMPORTANT - ALL THE TEMPERATURE SENSORS MUST BE SCI TYPE**

**N.T.C. Sensor; Temperature ~ Resistance Characteristics**

Temp °C	7.2	10.0	12.8	15.6	18.3	21.1	23.9	26.7	29.4	32.2
Temp ° F	45	50	55	60	65	70	75	80	85	90
Res. k	115.8	100.9	88.1	77.1	67.7	59.6	52.5	46.4	41.2	36.6

When fresh air damper is connected, and the operation is by TEMPERATURE, then T1 and T2 MUST be connected.

Logic for - T3 -T3 – Discharge temperature sensor

This temperature sensor is install in the plenum of the unit.

The sensor have to feel the outlet air of the unit.

IN COOL:

When the sensor will feel temperature of less than 30 degrees, it will turn off the compressor and leave the fan running.

When the sensor will feel temperature more than 40 degrees, the compressor will come back to work.

IN HEAT:

When 110°F the furnace will shot down.

When 98°F the furnace will come back to work.

All the temperature sensors are OPTION, if they are connected the main board will work by them.  
 If the sensors are not connected the main board will disregard the inputs.

When connecting or disconnecting the temperature sensors disconnect the main 24Vac power of the main board.



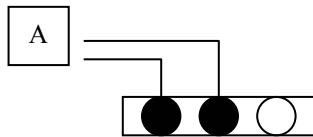
## 7. Hardware Jumper Explanations

IMPORTANT - BEFORE MAKING ANY CHANGES IN THE HARDWARE JUMPERS, DISCONNECT ELECTRICITY AT THE MAIN SWITCH.

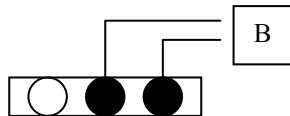
- the main board there are hardware jumpers for the configuration of the system
- these jumpers have 3 pins and they are shorted with the black plastic cover

### They can be in position A

Jumper short - when the black cover is placed on the 2 pins. (2 pins shorted)  
 Jumper open - when the 2 pins of the jumper are NOT SHORTED (2 pins open)



or in position B



A	B	A	B
○ ○ ●	○ ○ ●	H.PUMP	E.HEAT
JP4			
○ ○ ●	○ ○ ●	E.HEAT	OIL
JP3			
○ ○ ●	○ ○ ●	TIME D.	NO T.D.
JP2			
○ ○ ●	○ ○ ●		
JP1			

in the main board

	position A	position B
JP4 (Jumper 4)	H. PUMP (heat pump mode)	NO H.P. (no heat pump) (E.Heat)
JP3 (jumper 3)	E.HEAT (fan mode electric)	OIL/GAZ (fan mode oil/gas)
JP2 (jumper 2)	TIME D. (normal time delay)	NO T.D. (short times for TEST ONLY)
JP1 (jumper 1)	B (heat pump active in heat)	O (heat pump active in cool)

### Factory default

- Non heat pump
- Fan electric
- Yes time delay
- Heat pump "B"



7.1 How to Change the Jumpers

To change the jumpers disconnect the main 24Vac from the main board, make the necessary changes and reconnect the main 24Vac.

**9. Technician settings – in the master unit (please refer to the specific operating manual)**

- Economy mode set points
- fresh air damper logic (if connected)- Smart Vent

9.1 In the master thermostat : (see chart below)

- Select set point cool = 50.
- press and hold the "settings" button, until the display will flash "COOL" and "80".  
 this is the set point for the cool mode in the "SET BACK" mode. change with the +/- buttons.
- press again the "setting" button, the "HEAT" and "55"  
 . change with the +/- buttons.
- press again the "setting" button, "F1" will appear in the display . change with the +/- buttons in between (fresh air damper logic)
- F1 - open by time
- F2 - open by temperature (the T1 and T2 sensors must be connected) - (Smart vent)

If F1 is selected, the display will show "00", this is the amount of minutes for the fresh air damper to be open per hour and with the +/- buttons you can choose . 00-15-30-45-60.

Sample : if the "00" is selected that means the fresh air damper will be close all the time.

if "60" was selected that means the fresh air damper will be open all the time.

If F2-is selected, press "setting" button, adjust the set point for smart vent with set buttons (range 60-80°F), press "setting" button again and adjust with set buttons the DIFF for smart vent (3-10 degree).

- Press again the display will show "03", this is to short time delay , TEST ONLY, make sure that the number "3" is flashing before press setting again to return to normal display.

9.2. Logic of Fresh Air Damper (when connected)

The fresh air damper output can work by:

- Time (0-15-30-45-60 minutes per hour)
- Temperature (differential in between indoor temperature T1 and outdoor temperature T2) - Smart Vent

These 2 options can be selected in the master thermostat. See 9.1

**12. Logic for the By Pass output**

This is an extra damper output that will open with the last zone.

Logic:

By pass	Zone 1	Zone 2	Zone 3	Zone 4	etc
close	open	open	open	open	
close	open	open	open	close	
close	open	open	close	close	
<b>open</b>	<b>open</b>	close	close	close	
close	open	open	close	close	

THE BY PASS OUTPUT IS OPTIONAL. THE SYSTEM WILL WORK NORMALLY WITHOUT THIS CONNECTION



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#### 14. Troubleshooting for Technician

##### 14.1. The display is blank in the thermostats

The unit is not getting 24 Vac

Check the wiring connections for the thermostats. SEE # 6

##### 14.2. Cool stages do not switch on

Check the Rc connection.

##### 14.3. Heat stages do not switch on

Check the Rh connection.

##### 14.4. The display in the thermostats shows the word "PROGRAM" without the name

The unit is in OVERRIDE mode, the name of the program will reappear when the next program will start working.

##### 14.5. Dampers are nor opening or closing.

- Make sure that the thermostat of the same zone is ON.

- Make sure that there is demand (cooling or heating)

- To test that the damper is working unplug the quick connector of the damper, plug it the OPEN socket this is a ALWAYS hot socket , make sure that the damper is opening.

After plug the damper into the CLOSE socket , to see that closes.

For the OPEN and CLOSE sockets see main board layout # 5.1.2

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